Space Weather Forecast

Issued on Wednesday 5 February 2025 at 00:08 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of a glancing blow from a coronal mass ejection day 2 (06 Feb). Further Moderate-class flares expected, slight chance of a Strong flare.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was moderate over the past 24 hours, with fairly frequent Moderate-class flares, most of which originated from the complex spot spanning centre disc. There are eight active regions on the Earth-facing disc. The majority of the activity is from the broad cluster of sunspots in the north spanning the central disc into the western hemisphere. These form a rather large and magnetically complex area. There is one notable spot toward the rear of this region which continues to slowly increase in overall areal extent, and has two delta configurations within its intermediate and trailer spots.

No Earth directed CMEs (coronal mass ejections) were observed in available imagery in the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds showed a gradual declining trend from slightly elevated levels to near background. The Interplanetary Magnetic Field, was weak, with the north-south component largely weakly positive. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Generally Moderate activity is forecast, with Moderate flares expected at times and a slight chance of isolated Strong flares, primarily from the regions in the north spanning centre disc into the western hemisphere..

Solar Wind / Geomagnetic Activity: A coronal mass ejection associated with a flare late on 02 Feb may give a glancing blow with Earth on the morning of day 2 (06 Feb), although this is low confidence. The potential for further coronal mass ejections is elevated.

Solar wind speeds are expected to continue generally at or near background levels for much of the period, but may return to slightly elevated or elevated levels for a time on day 2 (06 Feb), following any potential CME arrival. The next fast stream of solar wind is expected to most likely arrive at

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Earth beyond the current forecast period, although there is a chance it may become geoeffective later day 4 (08 Feb).

Generally Quiet (Kp 0-2) geomagnetic activity is expected for much of the period. However, there is a chance following any potential CME arrival on day 2, of seeing activity temporarily increase to G1-G2/Minor-Moderate Geomagnetic Storm intervals (Kp 5-6). Also, later day 4 there is a slight chance for G1/Minor Storm conditions to develop should the next fast stream of solar wind arrive.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to remain at background levels. However, there is a slightly increasing risk of a rise through this period as the cluster of sunspots in the north move further into the western hemisphere.

Geomagnetic Storms

Geomagnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	10	40	20	20
Strong	G3	No	1	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	Yes	80	80	80	80
Very Active	R3-R5 (X Class)	No	20	20	20	20

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	20	25	30	30
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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